

**SEARCH REQUEST FORM**  
Scientific and Technical Information Center

Requester's Full Name: P. Laufer Examiner#: 73139 Date: 10/15/01  
Art Unit: 2100 Phone Number: 306-4160 Serial Number: 091821371  
Mail Box and Bldg/Room Location: \_\_\_\_\_ Results Format Preferred (circle): Paper Disk E-mail

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*  
Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc., if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: \_\_\_\_\_

Inventors (please provide full names): \_\_\_\_\_

Earliest Priority Filing Date: \_\_\_\_\_

*\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

*Litigation*

*5,890,128*

10-15-01 P12:08 IN

\*\*\*\*\*

**STAFF USE ONLY**

Searcher: S. Green  
Searcher Phone: 6-4767  
Searcher Location: 4B40  
Date Searcher Picked Up: 10/15/01  
Date Completed: 10/15/01  
Searcher Prep & Review Time: \_\_\_\_\_  
Clerical Prep Time: \_\_\_\_\_  
Online Time: \_\_\_\_\_

**Type of search**

NA Sequence (#) \_\_\_\_\_  
AA Sequence (#) \_\_\_\_\_  
Structure (#) \_\_\_\_\_  
Bibliographic \_\_\_\_\_  
Litigation ☒ \_\_\_\_\_  
Full Text \_\_\_\_\_  
Patent Family \_\_\_\_\_  
Other \_\_\_\_\_

**Vendors and cost where applicable**

STN \_\_\_\_\_  
Dialog 1 min  
Questel/Orbit 6 1/2 min  
Dr. Link \_\_\_\_\_  
Lexis/Nexis 3 1/2  
Sequence System \_\_\_\_\_  
WWW/Internet \_\_\_\_\_  
Other (specify) \_\_\_\_\_

**Green, Shirelle**

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**From:** Laufer, Pinchus  
**Sent:** Monday, October 15, 2001 11:41 AM  
**To:** STIC-EIC2100  
**Subject:** More litigation searches - CAN THESE BE PUT "NEXT"

**Importance:** High

Here are 2 more; CAN THESE BE DONE BEFORE THE 3?

(1) 09/821,371 which is a Reissue of US Patent 5,890,128 Inventors: Benjamin Diaz and M. Inez Genera

(2) 09/871,978 which is a Reissue of US Patent 5,910,181 Inventors: Makoto Hatakenaka et al.

Thank You,

*Pinchus*

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Special Programs Examiner, Technology Center 2100  
Computer Architecture, Software, & Electronic Commerce  
US Patent and Trademark Office  
(703) 306-4160  
plaufer@uspto.gov

S1 1 PN="US 5890128"  
?t s1/9

1/9/1

DIALOG(R)File 345:Inpadoc/Fam.& Legal Stat  
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15093811

Basic Patent (No,Kind,Date): US 5890128 A 990330 <No. of Patents: 001>

PATENT FAMILY:

UNITED STATES OF AMERICA (US)

Patent (No,Kind,Date): US 5890128 A 990330  
PERSONALIZED HAND HELD CALORIE COMPUTER (ECC) (English)  
Patent Assignee: DIAZ H BENJAMIN (US); GENERA M INEZ (US)  
Author (Inventor): DIAZ H BENJAMIN (US); GENERA M INEZ (US)  
Priority (No,Kind,Date): US 610380 A 960304  
Applic (No,Kind,Date): US 610380 A 960304  
National Class: \* 705002000; 128921000; 364400000; 364700000  
IPC: \* G06F-017/00  
Derwent WPI Acc No: \* G 99-243498; G 99-243498  
Language of Document: English

UNITED STATES OF AMERICA (US)

Legal Status (No,Type,Date,Code,Text):

US 5890128	P	960304	US AE	APPLICATION DATA (PATENT)
				(APPL. DATA (PATENT))
			US 610380 A	960304
US 5890128	P	990330	US A	PATENT

Litigations - 5890128 - P. Laufer

?us5890128/pn

Term not in index/PN-LITA : US5890128

LGST	1
CRXX	1
LITA	0
PAST	1

\*\* SS 1 : Results 3

Search statement 2

?prt ssl max 1-3

1/3 LGST (1/1) - (C) LEGSTAT  
PN - US 5890128 [US5890128]  
AP - US 610380/96 19960304 [1996US-0610380]  
DT - US-P  
ACT - 19960304 US/AE-A  
APPLICATION DATA (PATENT)  
{US 610380/96 19960304 [1996US-0610380]}  
- 19990330 US/A  
PATENT  
- 20010814 US/RF  
REISSUE APPLICATION FILED  
20010329  
UP - 2001-40

2/3 CRXX (1/1) - (C) CLAIMS/RRX  
AN - 3131768  
PN - 5,890,128 A 19990330 [US5890128]  
PA - Diaz, H BenjaminGenera, M Inez  
PT - E (Electrical)  
ACT - 20010329 REISSUE REQUESTED  
ISSUE DATE OF O.G.: 20010814  
REISSUE REQUEST NUMBER: 09/821371  
EXAMINATION GROUP RESPONSIBLE FOR REISSUEPROCESS: 2761

Reissue Patent Number:

UP - 2001-33  
UACT- 2001-08-14

3/3 PAST (1/1) - (C) PAST  
AN - 200133-001702  
PN - 5890128 A [US5890128]  
DT - A (UTILITY)  
OG - 2001-08-14  
CO - REA  
ACT - REISSUE APPLICATION FILED  
SH - REISSUE APPLICATION FILED

Shirelle Green EIC 2100

5,890,128

<=2> GET 1st DRAWING SHEET OF 17

Mar. 30, 1999

Personalized hand held calorie computer (ECC)

INVENTOR: Diaz, H. Benjamin, P. O. Box 294, Brea, California 92622  
Genera, M. Inez, P. O. Box 294, Brea, California 92622

CORE TERMS: screen, user, button, caloric, menu, calories, lifestyle, fat,  
target, calorie...

LEXIS-NEXIS  
Library: PATENT  
File: ALL

5,890,128 OR 5890128

Your search request has found no CASES.

To edit the above request, use the arrow keys. Be sure to move the cursor to the end of the request before you enter it.

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What you enter will be Search Level 1.

For further explanation, press the H key (for HELP) and then the ENTER key.

LEXIS-NEXIS  
Library: PATENT  
File: CASES

5,890,128 OR 5890128

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**LEXIS-NEXIS**  
**Library: NEWS**  
**File: CURNWS**

5,890,128 OR 5890128

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**LEXIS-NEXIS**  
**Library: PATENT**  
**File: JNLS**



18 results

	Document ID	Issue Date	Inventor	Current OR	Current XRef	Pages
1	EP 537113 A1	19930412	IN			11
2	US 5890128 A	19990330	Diaz, H. Benjamin , et al.	705/2	128/921 ; 700/90 ; 708/100	33
3	US 5796640 A	19980818	Sugarman, Henry , et al.	708/132	128/921	23
4	US 5704350 A	19980106	Williams, III, William B.	600/300	128/921 ; 708/132	24
5	US 3984666 A	19761005	Barron, Benjamin	702/44	322/28 ; 377/19 ; 377/5 ; 482/57 ; 482/8 ; 73/379.07	7

# DIALOG 17 NOVEMBER 2001

File 2:INSPEC 1969-2001/Nov W3 (c) 2001 Institution of Electrical Engineers  
File 6:NTIS 1964-2001/Dec W1 (c) 2001 NTIS, Intl Cpyrght All Rights Res  
File 7:Social SciSearch(R) 1972-2001/Nov W3 (c) 2001 Inst for Sci Info  
File 8:Ei Compendex(R) 1970-2001/Nov W2 (c) 2001 Engineering Info. Inc.  
File 9:Business & Industry(R) Jul/1994-2001/Nov 16 (c) 2001 Resp. DB Svcs.  
File 14:Mechanical Engineering Abs 1973-2001/Nov (c) 2001 Cambridge Sci Abs  
File 15:ABI/Inform(R) 1971-2001/Nov 17 (c) 2001 ProQuest Info&Learning  
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File 20:World Reporter 1997-2001/Nov 17 (c) 2001 The Dialog Corporation  
File 34:SciSearch(R) Cited Ref Sci 1990-2001/Nov W3 (c) 2001 Inst for Sci Info  
File 35:Dissertation Abs Online 1861-2001/Nov (c) 2001 ProQuest Info&Learning  
File 42:Pharmaceuticl News Idx 1974-2001/Nov W2 (c)2001 ProQuest Info&Learning  
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File 80:TGG Aerospace/Def.Mkts(R) 1986-2001/Nov 16 (c) 2001 The Gale Group  
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File 148:Gale Group Trade & Industry DB 1976-2001/Nov 16 (c)2001 The Gale Group  
File 149:TGG Health&Wellness DB(SM) 1976-2001/Nov W2 (c) 2001 The Gale Group  
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File 275:Gale Group Computer DB(TM) 1983-2001/Nov 15 (c) 2001 The Gale Group  
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File 347:JAPIO OCT 1976-2001/JUL(UPDATED 011105) (c) 2001 JPO & JAPIO  
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File 349:PCT FULLTEXT 1983-2001/UB=20011115,UT=20011108 (c) 2001  
WIPO/Univentio  
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec (c) 1998 Inst for Sci Info  
File 442:AMA Journals 1982-2001/Oct B1 (c)2001 Amer Med Assn -FARS/DARS apply  
File 444:New England Journal of Med. 1985-2001/Nov W3 (c) 2001 Mass. Med. Soc.  
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File 475:Wall Street Journal Abs 1973-2001/Nov 16 (c) 2001 The New York Times

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File 813:PR Newswire 1987-1999/Apr 30 (c) 1999 PR Newswire Association Inc

Set	Items	Description
S1	46268	NUTRITION??? (5N) (FAT?? OR CALOR???? OR SUGAR?? OR CHOLESTEROL?? OR SODIUM OR PROTEIN?? OR SALT OR CARB?? OR CARBOHYDRATE??)
S2	45969	(EXERCIS???? OR RUN OR RUNNING OR WALK OR WALKING OR JOG???? OR LIFT????) (5N) (FAT?? OR CALOR???? OR SUGAR?? OR CHOLESTEROL?? OR SODIUM OR PROTEIN?? OR SALT OR CARB?? OR CARBOHYDRATE??)
S3	524	S1 (S) S2
S4	736	S1 (10N) (TIME OR PERIOD OR INTERVAL)
S5	16659	NUTRITION??? (10N) (TIME OR PERIOD OR INTERVAL)
S6	1826	S2 (10N) (TIME OR PERIOD OR INTERVAL)
S7	23	(S4 OR S5) AND S6
S8	24	S3 AND (S4 OR S5)
S9	20	S3 AND S6
S10	55	S7 OR S8 OR S9
S11	48	RD S10 (unique items) [Scanned ti,kwic all]

11/9/12 (Item 1 from file: 149)  
DIALOG(R)File 149:TGG Health&Wellness DB(SM) (c) 2001 The Gale Group. All rts.  
reserv.

02010682 SUPPLIER NUMBER: 76966168 (THIS IS THE FULL TEXT)  
NUTRITION AND EXERCISE.  
GOLDBERG, JOCELYN M.  
RN, 64, 7, 34  
July, 2001  
PUBLICATION FORMAT: Magazine/Journal; Refereed  
ISSN: 0033-7021  
LANGUAGE: English  
RECORD TYPE: Fulltext  
TARGET AUDIENCE: Professional  
WORD COUNT: 3298  
LINE COUNT: 00276

1 TEXT: Nutrition and exercise aren't merely adjuncts to treating diabetes, they're essential  
2 components of the prescription for effective care. Understanding what they entail will help you  
3 support your patients and work effectively with other members of the diabetes team.

4 Nutrition and exercise are essential to maintaining the health and quality of life of people  
5 with diabetes mellitus. In light of this fact, patients with diabetes have a lot to learn: how to  
6 monitor their blood glucose levels, what changes to make in their eating habits, and how to sustain  
7 prescribed levels of physical activity. In addition, many will have to learn how to comply with  
8 a regimen of oral antidiabetic agents, insulin, or both.

9 Acquiring these skills can be a monumental task, one that patients should not be expected  
10 to accomplish alone. That's why managing diabetes requires ongoing intervention and education  
11 by a concerned multidisciplinary team, which should include--at a minimum--the patient's  
12 physician, a nurse, and a registered dietitian (RD). Because a nurse and a dietitian do much of the  
13 patient teaching, they should have specialized training or certification in diabetes and education.  
14 (1)

15 Whether you're an official member of the diabetes team or you  
16 JOCELYN GOLDBERG is an advanced practice nutritionist at the Mount Sinai Diabetes  
17 Center in New York City.

18 STAFF EDITOR. Emil Vernarec simply have patients with diabetes in your care, you need  
19 to understand how nutrition and exercise affect blood glucose. With this knowledge, you will be  
20 better able to support your patient's adherence to the nutrition, exercise, and self-management  
21 plans developed by the team.

22 Diet is best seen as a "nutrition prescription"

23 For patients with either Type 1 or Type 2 diabetes, diet should be considered medical  
24 nutrition therapy. According to the American Diabetes Association (ADA), there is no one  
25 "diabetic" or "ADA" diet; instead, what's required is an individualized "nutrition prescription."

26 Individualizing medical nutrition therapy can be a complex task. That's why the ADA

recommends that it be done by an RD, who takes into account the patient assessment, outcomes, and treatment goals. (2,3) The assessment is a detailed one. It needs to include the patient's medical history, current medication use, frequency and results of blood glucose monitoring, lab data, height and weight history, body composition results, typical eating patterns, timing of meals and snacks, and exercise regimen.

It also must include patient lifestyle data, such as work schedule and frequency of dining out or eating take-out food. The patient's learning style, readiness to change, and any barriers to such change must also be taken into account.

The goals of medical nutrition therapy include maintaining blood glucose levels as near to normal as possible, achieving optimal serum lipid levels, providing adequate calories, preventing and treating the acute and long-term complications of diabetes, and improving overall health. To accomplish these things, patients with diabetes need to understand how adjustments in food, medication, and physical activity affect their glucose levels.

They also need to learn the importance of monitoring their weight, blood pressure, lipid levels, blood glucose and glycosylated hemoglobin levels, and renal status. (2,4) The dietitian works with each patient to revise the nutrition plan as needed, based on these outcomes.

Meal plan centers around carb counting

Current ADA nutrition guidelines include a system called the "consistent-carbohydrate diabetes meal plan," which is replacing the traditional exchange system. (3) Instead of meal plans with specific calorie requirements, this approach focuses on carbohydrate content. The patient eats a comparable amount of carbohydrates at a given meal or snack each day, with the amount for each prescribed individually.

Carbohydrate counting is the preferred approach to meal planning because it reflects a more concrete and consistent connection between food, physical activity, and medication. Of all the macro-nutrients, carbohydrates have the greatest effect on post-meal blood glucose levels. Carbohydrates also determine pre-meal insulin requirements to a greater extent than does the amount of protein or fat in the meal.

This doesn't mean that your patient should stop watching his intake of protein and fat. It's necessary to watch both of these to avoid weight gain and serum lipid abnormalities, especially since diabetes is a risk factor for cardiovascular disease. In general, a patient with diabetes should get 10% -- 20% of his calories from animal or vegetable proteins--a recommendation similar to that for the general population. Patients who have developed nephropathy may need to limit their protein intake to about 10%.

The rest of the day's calories are distributed between fat and carbohydrates: 60% -- 70% should come from carbohydrates and monosaturated fats, less than 10% from saturated fats, and 10% or less from polyunsaturated fats. (2) High-fiber foods can help keep blood sugar from rising too fast after a meal, so remind patients to include them in their meal plans. A diabetes patient typically needs 20-35 gm of fiber per day--the same as a person without diabetes.

Using these general guidelines and carbohydrate counting, the dietitian fine-tunes the nutrition prescription and works with the nurse and other members of the healthcare team to help the patient gradually learn how to manage his diet. (57) As the box on page 38 shows, the patient progresses from learning how macro-nutrients affect blood glucose to advanced skills like fine-tuning insulin doses based on carbohydrate intake at a given meal and level of physical

activity.

Here's how a typical scenario might unfold: Mr. Beecham has Type 2 diabetes and is being treated with diet and exercise alone. At his initial nutrition assessment, he and the dietitian start with a goal of 40 - 45 gm of carbohydrates at breakfast each day. To assess this, he's told to test his blood sugar three times a day for one week: before breakfast, one hour after breakfast, and before lunch. He's also instructed to document the type of food he eats, the serving size, its carbohydrate content, and what activities (if any) he engages in each morning.

At Mr. Beecham's follow-up nutrition visit, he reviews the data with his dietitian. The pattern reveals that his one-hour post-breakfast and his pre-lunch blood sugar levels are consistently too high. Together, he and the dietitian look for reasons why and discuss strategies to improve his glucose control.

For instance, he could add a morning walk to help lower his pre-lunch blood sugar levels. Or he could decrease the carbohydrate amount at breakfast to 30-36 gin. Another strategy is to spread out the morning carbohydrate allotment by eating a smaller breakfast but adding a mid-morning snack. If these adjustments don't work, Mr. Beecham may need medication to help control his glucose levels.

All of this takes practice, and it may not come easy to patients. They may turn to you, their nurse, with their concerns and frustrations. You can help them along by reinforcing what has been taught and by offering support and encouragement as they go through the process.

#### Seeing exercise as a therapeutic tool

Some patients with diabetes may have trouble understanding that, like diet, exercise is an essential therapeutic tool. (8) In addition to its cardiovascular, weight, and overall health benefits, regular exercise--especially the aerobic type--can increase insulin sensitivity. This, in turn, can improve long-term glycemic control, reducing the need for insulin or oral medications. (9,10)

Remind patients to get a comprehensive physical exam before they begin exercising. The exam should include assessments for cardiac and macro- and microvascular complications. Based on this evaluation, the patient's exercise regimen should be individualized with an appropriate level of both aerobic and anaerobic activities.

Aerobic exercise (repeated rhythmic movements of the large muscles) improves heart and lung function, promotes endurance, and can lower blood glucose levels. Examples include brisk walking, bicycling, swimming, cross-country skiing, tennis, dancing, and hiking. Anaerobic exercise consists of short, rapid movements to build muscle mass or increase strength--weightlifting, stretching, yoga, golf, sit-ups, and push-ups, for instance.

It's important that you tell patients who have not been exercising to start with aerobic exercise only. Encourage them to choose an aerobic activity they enjoy and suggest that they involve a friend or family member. This not only makes exercising more fun, but the social support can help them comply with an exercise regimen.

You should caution patients that high-intensity, strenuous, or jarring activities, such as high-resistance weightlifting, high-impact aerobics, and racquet sports, can raise blood pressure. For that reason, those activities may not be appropriate for patients with retinopathy or kidney problems because of the risk of further vascular damage. Also emphasize the importance of wearing athletic shoes that fit well, are comfortable, and provide good support. Patients with peripheral neuropathy may have to avoid exercise that causes trauma to the feet because they may

not feel soreness as blisters or cuts are developing.

Patients who haven't been physically active need to start slowly. Suggest, for example, that they exercise for 10 minutes a day three to five times a week, and gradually progress to 30 - 45 minutes on most days. To prevent musculoskeletal injury, exercise should be preceded and followed by five to 10 minutes of slow, continuous aerobic activity--walking or stationary cycling, for example--and stretching, with each stretch held for 10-20 seconds.

#### How exercise may affect glucose levels

Because exercise uses up blood glucose and makes insulin work more efficiently, hypoglycemia can occur during, or as late as 24 hours after, activity. Remind patients to always check their blood glucose before they exercise, and to check it again during any exercise session that lasts an hour or longer. If it's less than 100 mg/dL before exercising, the patient should consume 15 gm of carbohydrates. He might, for example, have four to six crackers, 10 to 25 small pretzels, or one slice of bread.

Those with serum glucose levels greater than 240 mg/dL should check their urine or blood for ketones and postpone exercise if they are present. (8,10) If a patient's blood glucose is greater than 300 mg/dL and no ketosis is present, he should avoid exercise, since activity will lead to a further increase in blood sugar.

All diabetes patients must be vigilant about their blood glucose during exercise as well. Tell them to watch for symptoms of low blood sugar, such as dizziness, shakiness, headache, faintness, nervousness, or blurred vision. If any of these develop, they should stop immediately and re-check their blood sugar. They'll most likely need a carbohydrate snack. During prolonged exercise some patients find that they need a carbohydrate snack every 30 minutes. Tell them to always carry a source of fast-acting carbohydrates, such as glucose tablets or raisins.

Hyperglycemia is also a possibility during short-duration, high intensity activities-even if patients have normal blood glucose levels beforehand. In patients with Type 1 diabetes, ketone production may be stimulated and the patient may become nauseated or weak (which is why testing beforehand is so important). If these symptoms occur, the patient should stop exercising, take fluids, and follow any other recommendations from his healthcare provider.

Advise all patients with diabetes to test their blood sugar immediately after exercise . If they have exercised for a long period , they should also check it again several hours later, since they could develop delayed hypoglycemia. If blood sugar is below 100 mg/dL, the patient should take four glucose tablets, or drink 4 ounces of juice or 6 ounces of regular soda, or eat a mini-box of raisins.

Finally, warn patients that if they develop shortness of breath or pain in the chest, shoulder, neck, or arm that lasts for more than a few seconds, they should stop their workout and call their doctor or 911 at once.

As a nurse, you play a key role in coordinating the many facets of care for patients with diabetes. Your encouragement and reinforcement of the steps they need to take to achieve that unique balance of nutrition, medication, and physical activity will help ensure their success.

#### REFERENCES

(1.) American Diabetes Association. (2001). Position Statement: National standards for diabetes self-management education. Diabetes Care, 24(Suppl. 1), S126.

(2.) American Diabetes Association. (2001). Position Statement: Nutrition

recommendations and principles for people with diabetes mellitus. Diabetes Care 24(Suppl. 1), S44.

(3.) American Diabetes Association. (2001). Translation of the diabetes nutrition recommendations for health care institutions. Diabetes Care. 24(Suppl. 1). S48.

(4.) Diabetes Care and Education Dietetic Practice Group. (2000). Scope of practice for qualified dietetic professionals in diabetes care and education. J Am DietAssoc, 100(10). 1205.

(5.) Daly. A., Bany. B., et al. (1995). Carbohydrate counting: Getting started Alexandria. VA: American Diabetes Association; and Chicago: American Dietetic Association.

(6.) Daly, A., Barry, B., et al. (1995). Carbohydrate counting: Moving on. Alexandria, VA: American Diabetes Association; and Chicago: American Dietetic Association.

(7.) Daly, A., Barry, B., et al. (1995). Carbohydrate counting: Using carbohydrate/insulin ratios. Alexandria. VA: American Diabetes Association; and Chicago: American Dietetic Association.

(8.) American Diabetes Association. (2001). Position Statement: Diabetes mellitus and exercise, Diabetes Care 24(Suppl. 1), S51.

(9.) NIH Consensus Development Panel on Physical Activity and Cardiovascular Health. (1996). Physical activity and cardiovascular health. JAMA 276(3), 241.

(10.) American Diabetes Association. (2000). The diabetes ready-reference guide for health care professionals Alexandria, VA: Author.

#### A quick guide to nutrition and exercise

Nutrition and exercise are as much a part of your diabetes care as medication. Review this handout periodically. Call your physician, certified diabetes educator, or registered dietitian (RD) if you have any questions.

#### Nutrition

- \* Follow the meal plan developed by your RD.

- \* Keep a diary to help you identify how your diet, medications, and exercise/physical activity affect your sugar levels.

- \* Eat a consistent amount of carbohydrates at every meal and snack. Eat about the same time each day; don't skip any meals or snacks.

- \* Include high-fiber foods, which can help keep your blood sugar from rising too fast after you eat. They include whole-grain cereals and breads, beans, peas, lentils and other legumes, brown rice, barley, oats, and fresh fruits and vegetables.

- \* Reduce your fat intake, especially saturated fat. Cut back on butter, sour cream, fatty meats, whole milk, cheese, fried foods, and chips.

- \* Avoid foods high in sodium if you have high blood pressure. Don't add salt to your food.

- \* Use measuring cups and spoons and a food scale to estimate serving sizes more accurately.

- \* Drink alcohol on a full stomach. Limit quantities as recommended by your healthcare provider.

#### Exercise

- \* Check with your healthcare provider before starting an exercise program.

- \* Wear an emergency ID bracelet that says you have diabetes.



- 199           \* Choose your footwear carefully to avoid blisters/sores.
- 200           \* Limit exercise if the weather is extremely warm, humid, or cold. Don't exercise if
- 201 you're feeling ill or have an infection.
- 202           \* Check your blood glucose level before and after exercise--and during high-intensity,
- 203 long-duration exercise. If it's too low, eat a complex carbohydrate snack (four to six crackers, 10
- 204 to 25 small pretzels, or one slice of bread). If it's too high, stop exercising. If you're on insulin,
- 205 take it as prescribed.
- 206           \* Check your urine or blood for ketones if your blood sugar is higher than 240 mg/dL
- 207 before exercise. Postpone exercise if they're present. If no ketones are present but your blood
- 208 glucose is greater than 300 mg/dL, avoid exercise, since activity will lead to a further increase in
- 209 blood sugar.
- 210           \* Don't exercise when insulin is peaking. This will help you to avoid hypoglycemia.
- 211           \* Stop exercising and re-check your blood sugar if you feel weak, shaky, dizzy, sick to
- 212 your stomach, or irritable, or if you develop a headache.
- 213           \* Always carry a source of fast-acting carbohydrates, such as glucose tablets, raisins, or
- 214 juice, in case your blood sugar falls too low.
- 215           \* Stop exercising and call for help immediately if you develop pain or tightness in the chest
- 216 or chest/upper arm, heart palpitations, or shortness of breath.
- 217           Travel tips
- 218           \* Choose foods that are grilled, baked, steamed, or boiled--not fried. Ask for sauces and
- 219 dressings "on the side."
- 220           \* Always carry a snack in case your mealtime plans change or travel is delayed. Plan
- 221 ahead: Find out whether a meal or snack will be served on your flight.
- 222           \* Continue to monitor your blood sugar when you travel, especially after you've eaten
- 223 food you don't usually eat.
- 224           \* Take enough medication, insulin, and supplies for your trip--plus a little extra.
- 225           \* Always schedule physical activity into your day. Take stretch breaks. If no gym is
- 226 available, walk.
- 227           Carbohydrate counting: The basis for nutritional self-management
- 228           For patients with diabetes, carbohydrate counting has emerged as a preferred
- 229 meal-planning approach for achieving optimal blood glucose control. The method involves three
- 230 levels of knowledge and skill, each increasing in complexity but promoting greater flexibility in
- 231 food choices.
- 232           Level 1: Basic Patients learn:
- 233           \* how macronutrients affect blood glucose and overall health.
- 234           \* which foods contain carbohydrates (e.g., bread, crackers, fruit milk, cake, and
- 235 vegetables).
- 236           \* which size of food portions equals one carbohydrate choice (15 gin).
- 237           \* the importance of consuming consistent amounts of carbohydrates at meals and snacks.
- 238           \* how to use food scales, measuring cups, and spoons to size portions.
- 239           \* how to read nutrition labels.
- 240           \* how to develop a beginning meal plan.
- 241           \* how to keep food records that include pre- and post-meal blood glucose, carbohydrate

intake, and physical activity.

Level 2: Intermediate Patients learn:

- \* the relationship between food, medication, and physical activity.

- \* how to recognize and interpret blood glucose patterns.

- \* the strategies for managing blood glucose variations. These strategies include changing insulin doses, amount of carbohydrates, timing of carbohydrates intake, and amount of physical activity.

- \* how to use reference charts to determine the carbohydrate content of foods. They should also know how to translate complex foods such as restaurant meals, take-out foods, or combination foods into grams of carbohydrates.

- \* how excess protein and fat can contribute to weight gain, lipid abnormalities, and higher post-meal glucose levels three to five hours after a meal.

- \* how to make modest adjustments in insulin doses based on carbohydrate intake.

Level 3: Advanced Patients learn:

- \* how to further implement knowledge and skills of previous levels.

- \* how to use carbohydrate-to-insulin ratios based on pre- and post-meal blood glucose results, insulin doses, carbohydrate intake, and physical activity records.

SOURCES: 1. Gillespie, S. J., Kulkarni, K. D., & Daly, A. E. (1998). Using carbohydrate counting in diabetes clinical practice. *J Am Diet Assoc.* 98(8). 897.

2. Daly, A., Barry, B., et al. (1995). Carbohydrate counting: Getting started Alexandria. VA: American Diabetes Association; and Chicago: American Dietetic Association.

3. Daly, A., Barry, B., et al. (1995). Carbohydrate counting: Moving on Alexandria. VA: American Diabetes Association; and Chicago: American Dietetic Association.

4. Daly, A., Barry, B., et al. (1995). Carbohydrate counting. Using carbohydrate/insulin ratios. Alexandria, VA: American Diabetes Association; and Chicago: American Dietetic Association.

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1 TEXT: Nutrition and exercise aren't merely adjuncts to treating diabetes, they're essential  
2 components of the prescription for effective care. Understanding what they entail will help you  
3 support your patients and work effectively with other members of the diabetes team.

4 Nutrition and exercise are essential to maintaining the health and quality of life of people  
5 with diabetes mellitus. In light of this fact, patients with diabetes have a lot to learn: how to  
6 monitor their blood glucose levels, what changes to make in their eating habits, and how to sustain  
7 prescribed levels of physical activity. In addition, many will have to learn how to comply with  
8 a regimen of oral antidiabetic agents, insulin, or both.

9 Acquiring these skills can be a monumental task, one that patients should not be expected  
10 to accomplish alone. That's why managing diabetes requires ongoing intervention and education  
11 by a concerned multidisciplinary team, which should include--at a minimum--the patient's  
12 physician, a nurse, and a registered dietitian (RD). Because a nurse and a dietitian do much of the  
13 patient teaching, they should have specialized training or certification in diabetes and education.  
14 (1)

15 Whether you're an official member of the diabetes team or you  
16 JOCELYN GOLDBERG is an advanced practice nutritionist at the Mount Sinai Diabetes  
17 Center in New York City.

18 STAFF EDITOR. Emil Vernarec simply have patients with diabetes in your care, you need  
19 to understand how nutrition and exercise affect blood glucose. With this knowledge, you will be  
20 better able to support your patient's adherence to the nutrition, exercise, and self-management  
21 plans developed by the team.

22 Diet is best seen as a "nutrition prescription"

23 For patients with either Type 1 or Type 2 diabetes, diet should be considered medical  
24 nutrition therapy. According to the American Diabetes Association (ADA), there is no one  
25 "diabetic" or "ADA" diet; instead, what's required is an individualized "nutrition prescription."

26 Individualizing medical nutrition therapy can be a complex task. That's why the ADA

recommends that it be done by an RD, who takes into account the patient assessment, outcomes, and treatment goals. (2,3) The assessment is a detailed one. It needs to include the patient's medical history, current medication use, frequency and results of blood glucose monitoring, lab data, height and weight history, body composition results, typical eating patterns, timing of meals and snacks, and exercise regimen.

It also must include patient lifestyle data, such as work schedule and frequency of dining out or eating take-out food. The patient's learning style, readiness to change, and any barriers to such change must also be taken into account.

The goals of medical nutrition therapy include maintaining blood glucose levels as near to normal as possible, achieving optimal serum lipid levels, providing adequate calories, preventing and treating the acute and long-term complications of diabetes, and improving overall health. To accomplish these things, patients with diabetes need to understand how adjustments in food, medication, and physical activity affect their glucose levels.

They also need to learn the importance of monitoring their weight, blood pressure, lipid levels, blood glucose and glycosylated hemoglobin levels, and renal status. (2,4) The dietitian works with each patient to revise the nutrition plan as needed, based on these outcomes.

#### Meal plan centers around carb counting

Current ADA nutrition guidelines include a system called the "consistent-carbohydrate diabetes meal plan," which is replacing the traditional exchange system. (3) Instead of meal plans with specific calorie requirements, this approach focuses on carbohydrate content. The patient eats a comparable amount of carbohydrates at a given meal or snack each day, with the amount for each prescribed individually.

Carbohydrate counting is the preferred approach to meal planning because it reflects a more concrete and consistent connection between food, physical activity, and medication. Of all the macro-nutrients, carbohydrates have the greatest effect on post-meal blood glucose levels. Carbohydrates also determine pre-meal insulin requirements to a greater extent than does the amount of protein or fat in the meal.

This doesn't mean that your patient should stop watching his intake of protein and fat. It's necessary to watch both of these to avoid weight gain and serum lipid abnormalities, especially since diabetes is a risk factor for cardiovascular disease. In general, a patient with diabetes should get 10% -- 20% of his calories from animal or vegetable proteins--a recommendation similar to that for the general population. Patients who have developed nephropathy may need to limit their protein intake to about 10%.

The rest of the day's calories are distributed between fat and carbohydrates: 60% -- 70% should come from carbohydrates and monosaturated fats, less than 10% from saturated fats, and 10% or less from polyunsaturated fats. (2) High-fiber foods can help keep blood sugar from rising too fast after a meal, so remind patients to include them in their meal plans. A diabetes patient typically needs 20-35 gm of fiber per day--the same as a person without diabetes.

Using these general guidelines and carbohydrate counting, the dietitian fine-tunes the nutrition prescription and works with the nurse and other members of the healthcare team to help the patient gradually learn how to manage his diet. (57) As the box on page 38 shows, the patient progresses from learning how macro-nutrients affect blood glucose to advanced skills like fine-tuning insulin doses based on carbohydrate intake at a given meal and level of physical

activity.

Here's how a typical scenario might unfold: Mr. Beecham has Type 2 diabetes and is being treated with diet and exercise alone. At his initial nutrition assessment, he and the dietitian start with a goal of 40 - 45 gm of carbohydrates at breakfast each day. To assess this, he's told to test his blood sugar three times a day for one week: before breakfast, one hour after breakfast, and before lunch. He's also instructed to document the type of food he eats, the serving size, its carbohydrate content, and what activities (if any) he engages in each morning.

At Mr. Beecham's follow-up nutrition visit, he reviews the data with his dietitian. The pattern reveals that his one-hour post-breakfast and his pre-lunch blood sugar levels are consistently too high. Together, he and the dietitian look for reasons why and discuss strategies to improve his glucose control.

For instance, he could add a morning walk to help lower his pre-lunch blood sugar levels. Or he could decrease the carbohydrate amount at breakfast to 30-36 gin. Another strategy is to spread out the morning carbohydrate allotment by eating a smaller breakfast but adding a mid-morning snack. If these adjustments don't work, Mr. Beecham may need medication to help control his glucose levels.

All of this takes practice, and it may not come easy to patients. They may turn to you, their nurse, with their concerns and frustrations. You can help them along by reinforcing what has been taught and by offering support and encouragement as they go through the process.

Seeing exercise as a therapeutic tool

Some patients with diabetes may have trouble understanding that, like diet, exercise is an essential therapeutic tool. (8) In addition to its cardiovascular, weight, and overall health benefits, regular exercise--especially the aerobic type--can increase insulin sensitivity. This, in turn, can improve long-term glycemic control, reducing the need for insulin or oral medications. (9,10)

Remind patients to get a comprehensive physical exam before they begin exercising. The exam should include assessments for cardiac and macro- and microvascular complications. Based on this evaluation, the patient's exercise regimen should be individualized with an appropriate level of both aerobic and anaerobic activities.

Aerobic exercise (repeated rhythmic movements of the large muscles) improves heart and lung function, promotes endurance, and can lower blood glucose levels. Examples include brisk walking, bicycling, swimming, cross-country skiing, tennis, dancing, and hiking. Anaerobic exercise consists of short, rapid movements to build muscle mass or increase strength--weightlifting, stretching, yoga, golf, sit-ups, and push-ups, for instance.

It's important that you tell patients who have not been exercising to start with aerobic exercise only. Encourage them to choose an aerobic activity they enjoy and suggest that they involve a friend or family member. This not only makes exercising more fun, but the social support can help them comply with an exercise regimen.

You should caution patients that high-intensity, strenuous, or jarring activities, such as high-resistance weightlifting, high-impact aerobics, and racquet sports, can raise blood pressure. For that reason, those activities may not be appropriate for patients with retinopathy or kidney problems because of the risk of further vascular damage. Also emphasize the importance of wearing athletic shoes that fit well, are comfortable, and provide good support. Patients with peripheral neuropathy may have to avoid exercise that causes trauma to the feet because they may

not feel soreness as blisters or cuts are developing.

Patients who haven't been physically active need to start slowly. Suggest, for example, that they exercise for 10 minutes a day three to five times a week, and gradually progress to 30 - 45 minutes on most days. To prevent musculoskeletal injury, exercise should be preceded and followed by five to 10 minutes of slow, continuous aerobic activity--walking or stationary cycling, for example--and stretching, with each stretch held for 10-20 seconds.

#### How exercise may affect glucose levels

Because exercise uses up blood glucose and makes insulin work more efficiently, hypoglycemia can occur during, or as late as 24 hours after, activity. Remind patients to always check their blood glucose before they exercise, and to check it again during any exercise session that lasts an hour or longer. If it's less than 100 mg/dL before exercising, the patient should consume 15 gm of carbohydrates. He might, for example, have four to six crackers, 10 to 25 small pretzels, or one slice of bread.

Those with serum glucose levels greater than 240 mg/dL should check their urine or blood for ketones and postpone exercise if they are present. (8,10) If a patient's blood glucose is greater than 300 mg/dL and no ketosis is present, he should avoid exercise, since activity will lead to a further increase in blood sugar.

All diabetes patients must be vigilant about their blood glucose during exercise as well. Tell them to watch for symptoms of low blood sugar, such as dizziness, shakiness, headache, faintness, nervousness, or blurred vision. If any of these develop, they should stop immediately and re-check their blood sugar. They'll most likely need a carbohydrate snack. During prolonged exercise some patients find that they need a carbohydrate snack every 30 minutes. Tell them to always carry a source of fast-acting carbohydrates, such as glucose tablets or raisins.

Hyperglycemia is also a possibility during short-duration, high intensity activities-even if patients have normal blood glucose levels beforehand. In patients with Type 1 diabetes, ketone production may be stimulated and the patient may become nauseated or weak (which is why testing beforehand is so important). If these symptoms occur, the patient should stop exercising, take fluids, and follow any other recommendations from his healthcare provider.

Advise all patients with diabetes to test their blood sugar immediately after exercise . If they have exercised for a long period , they should also check it again several hours later, since they could develop delayed hypoglycemia. If blood sugar is below 100 mg/dL, the patient should take four glucose tablets, or drink 4 ounces of juice or 6 ounces of regular soda, or eat a mini-box of raisins.

Finally, warn patients that if they develop shortness of breath or pain in the chest, shoulder, neck, or arm that lasts for more than a few seconds, they should stop their workout and call their doctor or 911 at once.

As a nurse, you play a key role in coordinating the many facets of care for patients with diabetes. Your encouragement and reinforcement of the steps they need to take to achieve that unique balance of nutrition, medication, and physical activity will help ensure their success.

#### REFERENCES

(1.) American Diabetes Association. (2001). Position Statement: National standards for diabetes self-management education. Diabetes Care, 24(Suppl. 1), S126.

(2.) American Diabetes Association. (2001). Position Statement: Nutrition

recommendations and principles for people with diabetes mellitus. Diabetes Care 24(Suppl. 1), S44.

(3.) American Diabetes Association. (2001). Translation of the diabetes nutrition recommendations for health care institutions. Diabetes Care. 24(Suppl. 1). S48.

(4.) Diabetes Care and Education Dietetic Practice Group. (2000). Scope of practice for qualified dietetic professionals in diabetes care and education. J Am DietAssoc, 100(10). 1205.

(5.) Daly. A., Bany. B., et al. (1995). Carbohydrate counting: Getting started Alexandria. VA: American Diabetes Association; and Chicago: American Dietetic Association.

(6.) Daly, A., Barry, B., et al. (1995). Carbohydrate counting: Moving on. Alexandria, VA: American Diabetes Association; and Chicago: American Dietetic Association.

(7.) Daly, A, Barry. B., et al. (1995). Carbohydrate counting: Using carbohydrate/insulin ratios. Alexandria. VA: American Diabetes Association; and Chicago: American Dietetic Association.

(8.) American Diabetes Association. (2001). Position Statement: Diabetes mellitus and exercise, Diabetes Care 24(Suppl. 1), S51.

(9.) NIH Consensus Development Panel on Physical Activity and Cardiovascular Health. (1996). Physical activity and cardiovascular health. JAMA 276(3), 241.

(10.) American Diabetes Association. (2000). The diabetes ready-reference guide for health care professionals Alexandria, VA: Author.

A quick guide to nutrition and exercise

Nutrition and exercise are as much a part of your diabetes care as medication. Review this handout periodically. Call your physician, certified diabetes educator, or registered dietitian (RD) if you have any questions.

Nutrition

\* Follow the meal plan developed by your RD.

\* Keep a diary to help you identify how your diet, medications, and exercise/physical activity affect your sugar levels.

\* Eat a consistent amount of carbohydrates at every meal and snack. Eat about the same time each day; don't skip any meals or snacks.

\* Include high-fiber foods, which can help keep your blood sugar from rising too fast after you eat. They include whole-grain cereals and breads, beans, peas, lentils and other legumes, brown rice, barley, oats, and fresh fruits and vegetables.

\* Reduce your fat intake, especially saturated fat. Cut back on butter, sour cream, fatty meats, whole milk, cheese, fried foods, and chips.

\* Avoid foods high in sodium if you have high blood pressure. Don't add salt to your food.

\* Use measuring cups and spoons and a food scale to estimate serving sizes more accurately.

\* Drink alcohol on a full stomach. Limit quantities as recommended by your healthcare provider.

Exercise

\* Check with your healthcare provider before starting an exercise program.

\* Wear an emergency ID bracelet that says you have diabetes.

- 199           \* Choose your footwear carefully to avoid blisters/sores.
- 200           \* Limit exercise if the weather is extremely warm, humid, or cold. Don't exercise if
- 201 you're feeling ill or have an infection.
- 202           \* Check your blood glucose level before and after exercise--and during high-intensity,
- 203 long-duration exercise. If it's too low, eat a complex carbohydrate snack (four to six crackers, 10
- 204 to 25 small pretzels, or one slice of bread). If it's too high, stop exercising. If you're on insulin,
- 205 take it as prescribed.
- 206           \* Check your urine or blood for ketones if your blood sugar is higher than 240 mg/dL
- 207 before exercise. Postpone exercise if they're present. If no ketones are present but your blood
- 208 glucose is greater than 300 mg/dL, avoid exercise, since activity will lead to a further increase in
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- 218           \* Choose foods that are grilled, baked, steamed, or boiled--not fried. Ask for sauces and
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- 238           \* how to use food scales, measuring cups, and spoons to size portions.
- 239           \* how to read nutrition labels.
- 240           \* how to develop a beginning meal plan.
- 241           \* how to keep food records that include pre- and post-meal blood glucose, carbohydrate



intake, and physical activity.

Level 2: Intermediate Patients learn:

- \* the relationship between food, medication, and physical activity.

- \* how to recognize and interpret blood glucose patterns.

- \* the strategies for managing blood glucose variations. These strategies include changing insulin doses, amount of carbohydrates, timing of carbohydrates intake, and amount of physical activity.

- \* how to use reference charts to determine the carbohydrate content of foods. They should also know how to translate complex foods such as restaurant meals, take-out foods, or combination foods into grams of carbohydrates.

- \* how excess protein and fat can contribute to weight gain, lipid abnormalities, and higher post-meal glucose levels three to five hours after a meal.

- \* how to make modest adjustments in insulin doses based on carbohydrate intake.

Level 3: Advanced Patients learn:

- \* how to further implement knowledge and skills of previous levels.

- \* how to use carbohydrate-to-insulin ratios based on pre- and post-meal blood glucose results, insulin doses, carbohydrate intake, and physical activity records.

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2. Daly, A., Barry, B., et al. (1995). Carbohydrate counting: Getting started Alexandria. VA: American Diabetes Association; and Chicago: American Dietetic Association.

3. Daly, A., Barry, B., et al. (1995). Carbohydrate counting: Moving on Alexandria. VA: American Diabetes Association; and Chicago: American Dietetic Association.

4. Daly, A., Barry, B., et al. (1995). Carbohydrate counting. Using carbohydrate/insulin ratios. Alexandria, VA: American Diabetes Association; and Chicago: American Dietetic Association.

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